

**REMARKS**

This amendment is responsive to the Office Action of September 18, 2008. Reconsideration and allowance of **claims 3-9, 11-14, and 16-22** are requested.

**The Office Action**

**Claims 2 and 8** were rejected under 35 U.S.C. § 102(b) as being anticipated by Lingren et al. (EP 1249713).

**Claims 3 and 9** were rejected under 35 U.S.C. § 103(a) as being unpatentable over Lingren et al. and in view of Orava et al. (U.S. Patent No. 5,955,733).

**Claims 4-6 and 18-20** were rejected under 35 U.S.C. § 102(b) as being anticipated by Lingren et al. or in the alternative under 35 U.S.C. § 103(a) as obvious.

**Claim 7** was rejected under 35 U.S.C. § 103(a) as being unpatentable under Lingren et al. in view of Chu et al. (U.S. Patent Application Publication 2004/0080952).

**Claims 11-12 and 21-22** were rejected under 35 U.S.C. § 103(a) as being unpatentable under Lingren et al. in view Anderton et al. (U.S. Patent Application Publication 2003/0095627) in further view of Appleby et al. (U.S. Patent Application Publication (U.S. Patent Application Publication 2003/0235272).

**Claims 13-14 and 17** were rejected under 35 U.S.C. § 103(a) as being unpatentable over Orava et al. in view of Lingren et al.

**Claim 16** was rejected under 35 U.S.C. § 103(a) as being unpatentable over ORava et al. in view of Lingren et al. in further view of Chu et al.

**The Present Application**

The present application is directed to a method and apparatus for mounting an array of detectors **46** to a socket **44**. The socket includes additional **rigid** pins for the purposes of accurately aligning the socket to a circuit board **40**, even when/if the softer, electrically conductive pins bend during mounting. A collimator **24** is precisely aligned over multiple detector arrays **46** by a collimator frame **58**. The

frame 58 includes pin holes that align it to the circuit board 40, thus aligning the collimator 24 to the detector arrays 46.

The above description of the present application is presented to the Examiner as background information to assist the Examiner in understanding the application. The above description is not used to limit the claims in any way.

### **The References of Record**

**Lingren** is exemplary of the acknowledged prior art discussed on pages 1 and 2 of the present application and suffers from the described alignment problems. In Lingren, an array of CZT crystals 210 is attached to a circuit carrier 214 via a connection plate 230. The circuit carrier 214 includes conducting pins 240 that engage a substrate with complimentary holes for the pins 240. Because electrical connectors like the pins 240 carry weak electrical signals, they are designed for optimum conductivity. A common problem is that the conducting pins 240 are typically fabricated of copper or other conductive metal which is typically relatively soft and can bend during insertion allowing the carrier circuit to twist or cant during insertion. Lingren, like the acknowledged prior art, lacks a mechanism for ensuring detector element alignment.

**Orava** discloses a similar device for removably mounting detectors 20 to a support 22. The detector assembly includes conductive bumps 5 that engage complimentary divots 7 in the support.

**Chu** is directed to an assembling structure of a backlight module for containing and fabricating components of the backlight module. The structure contains a frame and a bezel that are fastened together through hooks and holes on one of the sides.

**Anderton** discloses an x-ray system that comprises a collimator and a collimator frame which sense the location of the collimator by multiple position sensors.

**Appleby** is directed to a device comprising a cast collimator derived from a metallic foil stack mold and adapted to contain a plurality of radiation detecting devices.

**Concerns Identified By Examiner**

Regarding the concerns of **claim 16**, the “holes of only one of the longer and shorter dimensions being used” means that only the holes of the longer dimension or only holes of the shorter dimension are being used. Reference to this meaning can be found on pg. 5 lines 22-28 of the specification.

Regarding the concerns of **claim 22**, “each detector element having a plurality of electrical connection pins that mate with the plurality of electrical connections in the substrate” refers to each of the electrical detector elements have a plurality of pins that electrically mate with the electrical connections in the substrate. This meaning is disclosed in the specification on pg 5 lines 6-11 and therefore should not be considered new matter. Nonetheless, “elements” has been changed to “modules” to alleviate this issue.

**The Claims Distinguish Patentably  
Over the References of Record**

**Claims 4-6, 8, and 18-20** are not anticipated by Lingren. This rejection is hereby *traversed*.

More specifically, regarding **claim 4**, Lingren does not disclose “a means for mounting a collimator to the circuit board in alignment with the circuit board which includes a frame and an aligning means for aligning the frame and the circuit board.” Examiner refers Applicant to paragraph [0033] lines 1-2 and Figure 2 which discloses a housing that is secured about the module board, detection elements, and shielding material of the imaging head of a medical imaging system. Lingren fails to disclose a means for mounting and aligning a collimator with a circuit which includes a frame and a means for aligning the frame to the circuit board. **Claim 4** refers to a means to align and mount a collimator and a collimator mounting frame with a circuit board. Additionally, Examiner asserts that it would have been obvious to one of ordinary skill at the time of the invention to have the housing surround the collimator on the sides for the benefit of preventing stray radiation from adversely affecting the acquired image. The purpose of means for mounting a collimator and the frame of the mounting a collimator in alignment with the circuit board is not to provide a housing to prevent stray radiation from the collimator from affecting the acquired image. The purpose of the mounting and alignment means is to prevent the

small misalignments between the collimator apertures and the individual detector elements. Such small misalignments between the collimator apertures and the individual detector elements cause the vanes between the collimator apertures to overlay detector elements to different degrees. This would result in some detector elements having a larger or smaller radiation receiving area relative to other detector elements resultant in changing the relative amount of radiation received. It is respectfully submitted that it would have not been obvious to one of ordinary skill in the art to provide a means to align and mount a collimator and a collimator mounting frame to a circuit board in order to properly align the collimator in order to reduce misalignment with detectors that are also aligned with the circuit board via alignment pins.

Accordingly it is submitted that independent **claim 4** and **claims 3 and 5-9** which dependent therefrom distinguish patentably over the references of record.

**Claim 11** calls for "aligning and mounting a collimator mounting frame to the circuit board which frame mounts a collimator having a second set of rigid alignment pins in fixed alignment thereto, hence to the circuit board and the individual detector arrays, such that the collimator mounting frame is aligned with the arrays of detector elements." Examiner refers Applicant to paragraph [0033] lines 1-3 and Figure 2 of Lingren, paragraph [0042] of Anderton, and paragraph [0372] of Appleby. Lingren discloses a housing that is secured about the module board, detection elements, and shielding material of an imaging head. Anderton discloses a collimator frames which contains one or more position sensors which sense the location of the collimator as the collimator is adjusted to be fixed at specific position within the frame. Appleby discloses the use of a socket and pins to align the collimator with the array of the radiation detecting devices. It is respectfully submitted that Lingren, Anderton, or Appleby, nor the combination, teach aligning and mounting a collimator mounting frame to a circuit board by a second set of alignment pins so that collimator mounting frame is aligned with the array of detector elements.

Accordingly it is submitted that independent **claim 11** and **claims 12 and 21** which dependent therefrom distinguish patentably over the references of record.

**Claim 13** calls for "a frame that includes alignment holes of the second cross section, which align with the frame alignment holes in the substrate, and alignment holes of a third cross-section" and "a collimator having rigid alignment pins of the third cross-section for mounting the collimator in precise alignment with the frame, transitively aligning the collimator with the substrate and the detector modules" The Examiner refers Applicant to col. 5 and col. 6 of Orava and paragraphs [0032] and [0033] of Lingren. Orava discloses a mounting means by suction where alignment pins and holes are provided on the imaging device and imaging support to assist in locating the imaging device on the imaging device before suction. Lingren discloses an imaging head comprising a housing that is secured about the module board, detection elements, and shielding material. It is respectfully submitted that Orava or Lingren, nor the combination, teach a frame that includes alignment holes and a collimator have alignment pins for mounting the collimator in precise alignment with the frame and thereby aligning the collimator with the substrate, hence the detector elements that are also aligned with the substrate.

Accordingly it is submitted that independent **claim 13** and **claims 14** and **16-17** which dependent therefrom distinguish patentably over the references of record.

**Claim 18** calls for "a collimator alignment mechanism, said collimator alignment mechanism aligning the mechanical elements with the gaps separating the detector elements such that the apertures are aligned with the detector elements and wherein mechanism uses a frame to align the mechanical elements with the circuit board." It is respectfully submitted that Orava or Lingren, nor the combination, teach a collimator alignment mechanism which uses a frame to aligning mechanical elements with a circuit board.

Accordingly it is submitted that independent **claim 18** and **claims 19-20** which dependent therefrom distinguish patentably over the references of record.

**Claim 22** calls for "a frame that includes a plurality of collimator alignment apertures and a plurality substrate alignment apertures, the substrate alignment apertures aligning with the frame alignment apertures of the substrate, aligning the frame with the substrate" and "a collimator that includes a second set of rigid alignment pins that mate with the collimator alignment apertures in the frame,

aligning the collimator with the frame, and transitively aligning the collimator with the detector elements." Examiner refers Applicant to paragraph [0033] lines 1-3 and Figure 2 of Lingren, paragraph [0042] of Anderton, and paragraph [0372] of Appleby. It is respectfully submitted that Lingren, Anderton, or Appleby, nor the combination, teach aligning and mounting a collimator mounting frame to a circuit board by a second set of alignment pins so that collimator mounting frame is aligned with the array of detector elements.

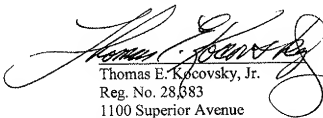
### CONCLUSION

For the reasons set forth above, it is submitted that **claims 3-9, 11-14, and 16-22** (all claims) distinguish patentably over the references of record and meet all statutory requirements. An early allowance of all claims is requested.

In the event the Examiner considers personal contact advantageous to the disposition of this case, the Examiner is requested to telephone Thomas Kocovsky at (216) 363-9000.

Respectfully submitted,

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